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Beyond military capabilities, SmarTruck II can be configured for homeland security, community service and humanitarian aid applications such as disaster relief and medical response.

National Automotive
Center Director Dennis
J. Wend

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Unveiling of SmarTruck II

By Paul D. Mehney

Tank Automotive Research, Development and Engineering Center

Warren, Mich. — With a large truck silhouetted behind a black curtain and as curious whispers floated through the crowd of more than 300 journalists and interested onlookers, National Automotive Center Director (NAC) Dennis J. Wend proudly stepped to the podium. This was the moment for which Army officials, media journalists and more than 1,100 associates of the NAC's parent organization, the Tank Automotive Research, Development and Engineering Center, had been waiting. SmarTruck II, the NAC's latest homeland security and counter-terrorism vehicle, was about to be unveiled at the 2003 North American International Auto Show in Detroit.



Unveiled at the North American International Auto Show in Detroit, SmarTruck II is the National Automotive Center's latest homeland security/counter-terrorism vehicle.

“SmarTruck II is a multi-purpose vehicle for what are, in reality, multi-purpose missions. This unique vehicle is now ready and able to meet the many challenges facing local, state and federal agencies,” said Wend, as he unveiled the vehicle before spectators.

Two years in the making,



SmarTruck II is the result of input gathered from a variety of military, law enforcement and government entities. This information then was merged by the NAC, Integrated Concepts & Research Corporation of Alexandria, Va., and Applied Minds, Inc., of Glendale, Calif., into a multi-purpose prototype vehicle built on a modified commercial Chevrolet Silverado platform.

Sporting 6x6 all wheel drive capability and an increased payload capacity, SmarTruck II can conquer virtually every terrain during homeland security, military or counter-terrorism missions. In part, the truck features a rugged, all metal stainless steel front grill guard, run flat tires, flood lights, adjustable blackout lights and the ability to launch and control an electric unmanned area vehicle, which has real-time video transmission capabilities. Most important, the SmarTruck II features a rapidly reconfigurable modular system design.

According to SmarTruck II Designer Bran Ferren, of Applied Mines Inc., "With this truck, you're not confined to any one mission, or any one technology. What you have, basically, is a platform that can take from one to six modules, or any combination that fits the form factor and payload capacity. It's the modules that provide the flexibility."



More than 800,000 people attended this year's Auto Show, which featured the National Automotive Center's SmarTruck II.

SmarTruck II is capable of accepting from one to six specialized modules that perform a variety of specific functions. Once they are plugged into the truck, a high-tech, onboard computer system, the Vehicle Operating System, recognizes the module and will automatically configure the truck's command and control capabilities.

With the module system, the SmarTruck II will excel in a variety of roles. Wend explained, "Beyond military capabilities, SmarTruck II can be configured for homeland security, community service and humanitarian aid applications such as disaster relief, medical response, surveillance, field kitchen, water purification, water pump and used as a command and control center."



SmarTruck II is built on a Chevrolet Silverado platform and is capable of accepting one to six

Auto show spectators were treated to four of the truck's most innovative module systems, the Base Power Module, Electro Optics Module, Weapons Module Pad and Integrated Communications Module. According to Germaine Fuller, SmarTruck II program manager, "The Base Power Module is the brain of the vehicle. Currently, SmarTruck II uses shore power, as not to deplete the vehicle's power for auxiliary units. The Base Power Module manages that power and acts as a control and switching center for AC/DC capabilities."

The module that grabbed the most auto show attention was the weapons system. The Weapons Module Pad boasts an impressive fire and forget missile system and its two supporting self-feeding magazines. Developed by the Navy specifically for the SmarTruck II platform, the missile system is a low-cost, man-packable system that houses 16 missiles and can fire two missiles simultaneously at independent targets. When not in use, the system retracts into the module for storage. Lastly, the communications module ensures that the vehicle crew can communicate securely with a variety of military and intelligence sources. This module also integrates 3D mapping capability, vehicle mounted thermal imaging and an in-vehicle surveillance radar that is capable of detecting moving objects within seven kilometers of SmarTruck II.

"The truck's purpose is to meet the requirements of a new, emerging challenge. We designed SmarTruck II for this role—to help people, and to save lives," said Ferren.

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The new seminar is designed specifically for executives and managers with little or no background in chemical and biological agent issues.

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Edgewood Center Helps Federal Employees Prepare for Terrorist Threat

Edgewood Chemical Biological Center

Aberdeen Proving Ground, Md. —The Edgewood Chemical Biological Center is offering seminars for federal executives that address the unique management issues when responding to a terrorist attack involving chemical or biological weapons. The seminars are being offered in partnership with the Office of Personnel Management and the Federal Emergency Management Agency.

After the Sept. 11, 2001, terrorist attacks, many officials identified a knowledge gap where attacks involving chemical and biological agents were concerned. Supported by the center's Homeland Defense Business Unit, the seminar serves as an introduction to chemical and biological agents and their implications. It also covers newly pertinent issues of building management, consequence management, infrastructure return-to-use, legal issues, health care and personnel management following an incident.

The one-day seminar includes classroom sessions and tabletop exercises. It is designed specifically for executives and managers with little or no background in chemical and biological agent issues. Instruction is patterned after the successful and established Senior Officials Workshop course, as utilized in the Domestic Preparedness Program of 1996 to 2000. In that effort, the center conducted workshops, training and exercises to educate first responders and city officials in more than 100 cities across the United States about appropriate and effective response to incidents involving chemical, biological and nuclear weapons.

For more information about the seminars, please contact the center's Public Affairs Office at (410) 436-4347.

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Canada, U.S. Collaborate on Future Fire Control

By Maj. Burry Vanderveer

Armaments Research, Development and Engineering Center

Picatinny Arsenal, N.J. — The Armaments Research, Development and Engineering Center (ARDEC) and the Defense Research and Development Canada recently established the Future Fire Control Systems Working Group under the North American Technical Industrial Base Organization. The group's mission is to leverage efforts and, thereby, field the world's best fire control for the U.S. Army's Objective Force and Canada's Army of Tomorrow.



(l.-r.) ARDEC Technical Director Michael Devine and U.S. co-chair; Cynthia Gonsalves, Office of the Secretary of Defense; Col. Dan Bulpit, Canada; and Denis Faubert, Canadian co-chair, sign the Future Fire Control Systems Working Group agreement at a recent signing ceremony held in Washington, D.C.

The Working Group takes a holistic view of fire control in that it encompasses the sensors, target/data analysis, expert systems to advise, weapon/platform control, ballistic calculations, munition arming/control and damage assessment functions in a networked environment. The other shared vision is to develop a common fire control for all platforms—regardless of role—with an open architecture.

This agreement marks the completion of two years of discussions and staffing effort. ARDEC Technical Director Michael Devine and Dr. Denis Faubert, director general of Defence Research and Development Canada, Valcartier, will serve as the working group's co-chairs.

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{The portable chapel} allows a place and a mechanism for the full dimension of worship, including religious education classes and fellowship.

Chap. (Maj.) John Wheatley, installation chaplain

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Containerized Chapel Helps Meet Religious Needs

Soldiers Systems Center

Natick, Mass. — Worship will be easier for soldiers and civilians at base camps after the Containerized Chapel, or portable chapel, goes into production this year.

The Containerized Chapel is a package of equipment transported in a single steel container that provides a multi-functional religious facility for a 550-person base camp.

From the outside, the only thing setting it apart is the chaplain's flag flying near the entrance of the extended tent. Inside, chaplains have everything they need for religious support such as altars, lecterns, linens, candles, cross and crucifix, offering plates, communion sets and several versions of the Bible to support Protestant and Catholic Christian worship. Supplies for Jewish and Islamic faiths include chaplain kits, yarmulkes, kufis, kimaras, prayer mats, Torahs and Korans.

The first complete Containerized Chapel prototype was built last year at the Soldier Systems Center and deployed in July 2002 to join a Force Provider base



A group of worshipers assemble at the Containerized Chapel, or portable chapel, which provides installations a range of religious services and activities.



camp at Kandahar Air Base, Afghanistan. Two more chapels first used in Kosovo in 1999 are set to deploy in support of Operation Enduring Freedom, and another chapel built at the Soldier Systems Center is waiting for the order to move out, according to Chap. (Maj.) John Wheatley, installation chaplain.

Eventually 40 of the portable chapels, developed by Product Manager-Force Sustainment Systems, will be positioned around the world and available for deployment for each Force Provider, the Army's deployable "tent city."

The need for portable chapels was identified when religious support equipment for missions in Haiti, Somalia, Bosnia, Albania and Macedonia was found to be substandard and often incomplete. Before the chapel arrived in Kandahar, for example, troops gathered in the airport terminal for services and tolerated intermittent power outages and oppressive heat.

"{The portable chapels} confirm that the military is willing to put full research and development into the tools for religious support," Wheatley said. "It certainly allows many more options for the worship needs of all soldiers."

The Containerized Chapel offers worshippers and staff other amenities. The climate-controlled chapel has a portable public address system, electronic keyboard, and if a musician is not on hand, the music will play automatically from a digital hymnal programmed with hundreds of worship songs. In addition, each chapel has its own generator, electrical outlets, lights and seats for 100 people. Other support items are six months worth of consumables, such as communion wafers, a TV/VCR, microwave oven, coffee pot and folding tables.

"This allows a place and a mechanism for the full dimension of worship, including religious education classes and fellowship," Wheatley said. "It's certainly a morale-booster. It becomes very visible and noticeable. Respect for the command is enhanced when they see such a clear support for these soldiers."

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The Advanced Chemistry Laboratory will be a 74,000 square-foot facility and will replace three older laboratories in the Edgewood Area.

\$38 Million Contract Awarded for Edgewood's Advanced Chemistry Lab

Edgewood Chemical Biological Center

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Aberdeen Proving Ground, Md. — Two Baltimore-based companies soon will begin work on a \$38 million contract to build an Advanced Chemistry Laboratory in the Edgewood Area of Aberdeen Proving Ground. Gaudreau Inc., an architectural firm, and Poole & Kent, a mechanical contracting company, will begin site preparation work in advance of the formal groundbreaking tentatively set for April 2003.

The Advanced Chemistry Laboratory will be a 74,000 square-foot facility and will replace three older laboratories in the Edgewood Area. Much of the research work performed in the new laboratory will support the nation's homeland defense efforts and its work to counter the evolving threat of chemical warfare.

The Edgewood Chemical Biological Center is a unique, national asset that has been the focus of research and development work involving chemical warfare agents for more than 80 years. The Advanced Chemistry Laboratory will allow the center to continue this important work by providing a state-of-the-art research facility with a flexible, modular design to meet the changing requirements of scientific advancements. The building also will feature sophisticated engineering controls and specially designed filters to ensure worker and environmental safety.

The new lab primarily will replace the Amos A. Fries Chemistry Building, constructed in 1963. Fries, who became commanding officer of Edgewood Arsenal in 1919, worked throughout his career to advance the Army's chemical training and to establish the Chemical Warfare Service as a permanent part of the post-WWI military. Fries retired as a major general in 1929 and died in 1963.

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The Prototype Integration Facility has been an invaluable organization, which has enabled us to rapidly fulfill a critical warfighter need for near-real-time situational awareness in an absolutely minimum amount of time.

Lt. Col. Tony Potts,
product manager, Blue
Force Tracking-Aviation
Program

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Aviation and Missile Command's Prototype Integration Facility

Getting Tomorrow's Technology to the Warfighter Today

*By Jim Bowne
Aviation & Missile Command*

Redstone Arsenal, Ala. — The Aviation and Missile Research, Development and Engineering Center's (AMRDEC) Prototype Integration Facility (PIF) has emerged as a focal point for agile development, rapid



prototyping and swift fielding of a new weapon system capability.

Located on Redstone Arsenal, the primary goal of the PIF is to support Army aviation, missile, Department of Defense and technology activities in the development, fabrication, integration and test/qualification of prototype tactical and ground support systems, subsystems and components. Additionally, the PIF offers capabilities that allow for manufacturing and integrating unique, difficult-to-procure and low-rate production items.

“The Aviation and Missile Research, Development and Engineering Center has had an electrical and mechanical prototyping and platform integration capability since the early 1970s, but this capability has been geographically and functionally separated,” explained Ronnie Chronister, chief, Manufacturing Science and Technology Division. “During fiscal year 2002, AMRDEC leadership successfully integrated these capabilities—functionally, organizationally and geographically—into what it now referred to as the PIF.”

Although the PIF organizational and operational concept builds off the foundation of the existing base of government expertise, it also integrates unique business principles to form a creative, powerful concept to assist PIF customers in their quest to rapidly provide hardware and software solutions to the warfighter. The primary tenants of the PIF concept include leveraging existing government and industry capabilities to provide a cost effective alternative that its customer base can use.



The newly dedicated Dr. Larry O' Daniel Prototype Integration Facility, located on Redstone Arsenal, Ala., is a 66,000 square foot, state-of-the-art prototyping, engineering, manufacturing and integration operation.

To augment existing in-house government resources, the PIF uses Aviation and Missile Command's Rapid Acquisition and Prototyping contract, a 10-year, \$1.1 billion contract awarded last year.

“The PIF contract allows us to leverage the capabilities of original equipment manufacturers and primes, capability-specific companies, and local small and disadvantaged businesses,” Whitaker explained.

The PIF's agile development capability and expertise provides customized and fully integrated turn-key solutions



through unprecedented design and engineering expertise. These capabilities include modeling and simulation, rapid prototyping, mechanical fabrication, circuit card assembly, cables and chassis build-up, platform integration, modification work order development, advanced manufacturing technologies and overall program/project management expertise.

“In today’s volatile environment,” Whitaker said, “a significant factor in the success of any organization, any specific program or any industry entity, is the ability to foster an open communication environment that results in cooperation among all of the stakeholders.”

PIF’s prime contractor, Joint Venture Yulista Science and Engineering Services—an Alaskan Native and Small Disadvantaged Business partnership—employs 68 percent of all personnel supporting the PIF operations.

“Using contractor support to augment existing government capabilities offers greater flexibility to reconfigure the organization as weapon system requirements shift and the need for a specific expertise diminishes or increases,” Whitaker said. “The PIF is a real-world example of how partnering with industry can reduce costs, decrease acquisition lead-times and increase warfighter readiness.”

There are many weapon systems and programs that leverage the PIF’s capabilities. One example is the Blue Force Tracking-Aviation (BFT-A) Program. The program has managed to maintain an aggressive schedule, resulting in the production and fielding of more than 200 BFT-A systems in less than six months.

According to Lt. Col. Tony Potts, BFT-A product manager, “The PIF has been an invaluable organization, which has enabled us to rapidly fulfill a critical warfighter need for near-real-time situational awareness in an absolutely minimum amount of time.”

Whitaker feels that from its multi-functional, multi-faceted platform integration projects to simplistic machining and fabrication, the PIF is postured for future success. “We offer our customers a ‘One Stop Shopping’ and ‘Turn-Key’ environment that ensures that the warfighter gets the absolute best technical solution, at the best price and at the highest quality level,” he said.

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The expanded scope of the DoD Ordnance Technology Consortium makes it easier to address the research and development ordnance needs of all the services, maintain tight alignment with the Army's transformation initiatives and focus on our nation's 21st century lethality needs.

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Warheads and Energetics Technology Center Becomes DoD Ordnance Technology Consortium

Armaments Research Development and Engineering Center

Picatinny Arsenal, N.J. — The Warheads and Energetics Technology Center model recently was adopted for the Department of Defense (DoD) and is now known as the DoD Ordnance Technology Consortium (DOTC).

Chartered on May 15, 2000, the technology center was formed as a partnership between Armaments Research, Development and Engineering Center and the Army Research Laboratory, located in Aberdeen, Md. This action signaled the first step in developing a Center of Excellence within DoD for energetics and warhead technologies whereby industry, academia and the government could freely participate to meet national defense needs for conventional lethality.

The expanded scope of the DOTC and continued support of DoD, industry and academia, makes it easier to address the research and development ordnance needs of all the services, maintain tight alignment with the Army's transformation initiatives and focus on our nation's 21st century lethality needs.

New Charter Includes Educational Opportunities and Distance Learning

The DOTC will now support the Office of the Secretary of Defense in a new and vital capacity as the point organization to expand learning opportunities into schools, colleges and universities. This program, called "Materials World Modules," already is underway with support of our industry partners at the local level. The goal is to develop the next generation of scientists, engineers, managers and technologists from within the United States in order to maintain our technology leads and national capabilities in the ordnance technology domain.

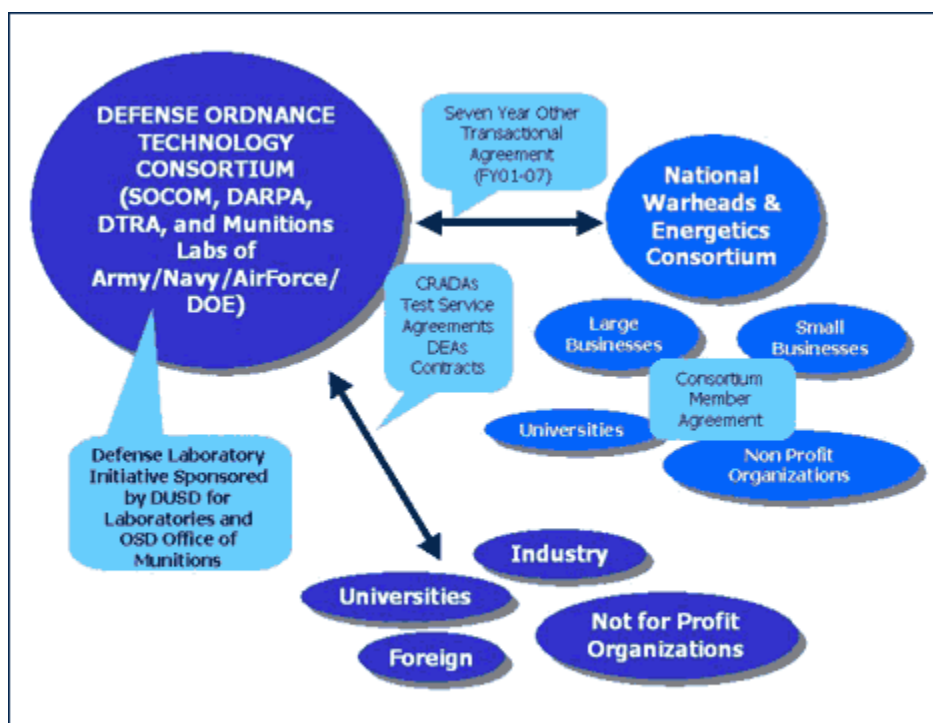
On March 17, the County College of Morris will host a training team from Northwestern University to train science and engineering volunteers from Picatinny in addition to the college's professors.

In addition, an on-post masters/PhD program in ordnance engineering is being pursued for implementation in fiscal year 2004. This will be a prototype distance-learning program that will be expanded to all DOTC and National Warheads and Energetics Consortium partners. The key to its success will be the identification of ordnance experts to serve as adjunct professors. These professors will document their many years of

experience and pass it on to the next generation of ordnance engineers.

Those interested in training high school science teachers or being an adjunct professor should contact Kathi Donoghue at donoghue@pica.army.mil.

For further information about the DOTC, please contact Ray Pawlicki, DOTC research director, at DSN: 880-3386.



The graphic shows the relationships between diverse organizations that comprise the DOTC/NWEC enterprise.

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Soldier System Center's Don Pickard and Frank Dileo received the 2003 Federal Laboratory Consortium Award for Excellence in Technology Transfer

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Heat Plus Cheap Electricity Equals Winning Combination

Soldier Systems Center

Natick, Mass. — A system that generates nearly free electricity while heating water or space has earned two Soldier Systems Center employees a 2003 Federal Laboratory Consortium Award for Excellence in Technology Transfer. This award recognizes laboratory employees who have accomplished outstanding work in the process of transferring federally developed technology to the marketplace.

Don Pickard, team leader, and Frank Dileo, project leader, with the

Equipment and Energy Technology Team, won the award for their submission titled "Small-Scale Cogeneration of Heat and Electric Power." They successfully developed and transitioned the first practical application of a small-scale co-generator that provides both heat and electric power using a single process for a battalion-level field kitchen.

The same technology has been applied to residential applications where electric power can be generated at high efficiency every time the home heater cycles on to heat water or space. Having demonstrated a system efficiency of more than 80 percent under the Dual Use Science and Technology Program, the technology transitioned to Climate Energy LCC, a partner of one of the largest suppliers of home HVAC systems in America, to develop high-efficiency residential co-generators.

By comparison, a current military heater used for field feeding is 25 percent efficient and a generator is 28 percent efficient. Cogeneration significantly reduces fuel consumption, noise, weight and volume. Instead of using dry saturated or superheated steam as in a conventional Rankine cycle, this cogeneration technology uses a high temperature two-phase mixture of steam and water that's injected into an expander. The alternator coupled to the expander produces electrical power, while the remaining heat is used for cooking and sanitation in a field kitchen, or warming a home or water in residential use.

The technology also can be applied to other Army field systems primarily driven by heat, such as showers, laundries and space heaters. The electric power produced by the co-generator can be connected to the house electric meter, which may actually run backwards at night or during the day when power demand is low.

Deregulation of the electric power industry allows this feature, called "net metering," which will significantly lower home electric bills and reduce demand on public utilities. Furthermore, liquid-injected cogeneration offers several environmental advantages. Electric power generation using residential co-generators is much more efficient than public utilities. It consumes less fuel, burns cleaner—similar to natural gas versus coal—and burns over a wider area compared to conventional power plants for less concentrated pollution.

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Edgewood's Response Program Enhancing Homeland Defense

Edgewood Chemical Biological Center

Aberdeen Proving Ground, Md. — The Military Improved Response Program (MIRP), operated by the Edgewood Chemical Biological

Center's Homeland Defense Business Unit, continues to enhance the Department of Defense (DoD) community's response to weapons of mass destruction terrorism. Through focused workshops, technical investigations and analytical exercises, MIRP experts have developed a number of enhanced response concepts and procedures that currently are being transitioned to DoD responders.

This past December, the MIRP developed and piloted a unique training course for the Aberdeen Proving Ground Police Academy. The course, designed to augment existing academy curricula, is the country's only police academy course that specifically considers weapons of mass destruction law enforcement operations for both patrol officers and tactical teams. As such, the course integrates the center's technical expertise in protective suits and contaminated environments with the tactical and domestic missions of law enforcement personnel.

In upcoming weeks, the MIRP will be working with DoD's Fire Academy at Goodfellow Air Force Base in San Angelo, Texas, to develop and pilot a similar HazMat technician training course in March. The course will cover considerations for both strategic incident command and tactical firefighter operations for a terrorist event.

Through a myriad of activities, the MIRP continues to partner with these and other DoD agencies and military units to help enhance the entire DoD community's response to weapons of mass destruction terrorism.

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ARL Director Retires After 36 Years of Distinguished Service

Army Research Laboratory

Adelphi, Md. — After 36 years of service to the Army, Dr. Robert W. Whalin, director of the Army Research Laboratory (ARL), retired from federal service. He now will apply his talents to an academic career and has accepted a position as associate dean for engineering and professor of engineering with the College of Science, Engineering and Technology at Jackson State University in Jackson, Miss.

Whalin served as director of the Army's corporate laboratory for basic



Dr. Robert W. Whalin, a 36-year Army

and applied research since December 1998. Prior to this appointment, he served as the first permanent civilian director of the Engineer Waterways Experiment Station in Vicksburg, Miss., from 1992 to 1998.

Some of his major awards include the Presidential Rank Award of Meritorious Executive (1987 and 2002), Presidential Rank Award of Distinguished Executive (1994), Department of the Army Meritorious Civilian Service Award (1993 and 1998), Department of the Army Award for Outstanding Achievement in Equal Opportunity (1985 and 1997) and the Silver Order of the deFleury Medal (1998).

Whalin is a member of Phi Kappa Phi and Phi Eta Sigma honorary fraternities, Sigma Xi research society, American Society of Civil Engineers, American Society for Engineering Education, Army Engineer Association, Association of the United States Army and the National Defense Industrial Association. He has authored and co-authored more than 100 technical papers and reports.

A native of Richmond, Ky., Whalin holds a bachelor's degree in physics from the University of Kentucky, a master's degree in physics from the University of Illinois and a Ph.D. in physical oceanography from Texas A&M University. Whalin is a registered Professional Engineer and is a world-renowned coastal engineer. In addition, he has served as adjunct professor at Mississippi State University, Texas A&M University and the University of Mississippi.

Whalin and his wife, the former Jacqueline Kearns also from Richmond, Ky., have one daughter, Ellen Kate of Baton Rouge, La., who is a speech communication instructor at Louisiana State University and is married to Russell D. Whitehead. The Whiteheads have one son, Andrew Warren.

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Maj. Gen. John C. Doesburg—RDECOM Transition Director
Miguel Morales—Chief, Public Affairs Office/G-5

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